WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (SUPPLEMENTARY SHEET)

International reference PCT/EP2004/000809

Re Point V.

1. Reference is made to the following documents in the present opinion:
D1: WO 00/41917 A (MADER GERHARD; SCHMIDT CLAUS (DE); HERMANN STEFAN (DE); SIEMENS AG (D) 20 July 2000 (2000-07-20)

2. Document D1 is considered to be the closest prior art. It discloses (the references in brackets relate to this document) on page 3 line 22 - page 9 line 20 and in the figures a control arrangement for occupant protection means in a motor vehicle,
- with a sensor field with at least two acceleration sensors (11, 12, 13, 14) being assigned to the control arrangement, said acceleration sensors (11, 12, 13, 14) having at least two sensor elements, which allow acceleration sensing along three sensitivity axes (u, v, w, x, y);
- with the sensitivity axes (u, v, w, x, y) of the sensor elements of the acceleration sensors (11, 12, 13, 14) spanning a plane, which after the control arrangement (2) has been integrated in a motor vehicle is essentially parallel to a plane defined by a longitudinal axis of the vehicle (A-A') and a transverse axis of the vehicle (B-B');
- with at least one evaluation device (3) comprising for normal and crash mode a safing routine to test the plausibility of all output signals (a_u, a_v, a_w a_x, a_y) of the sensors (11, 12, 13, 14) by creating a weighted sum from the output signals (a_u, a_v, a_w a_x, a_y) and a crash routine to evaluate the output signals (a_u, a_v, a_w, a_x, a_y); and for test mode a test routine, which sends a test signal to at least two acceleration sensors (11, 12, 13, 14) to generate output signals (a_u, a_v, a_w, a_x, a_y) to test the operation of the sensors (11, 12, 13, 14);
and a method for testing the operation of a control arrangement for occupant protection means in a motor vehicle,
- with a sensor field with at least two acceleration sensors (11, 12, 13, 14) being assigned to the control arrangement, said acceleration sensors (11, 12, 13, 14) having at least two sensor elements, which allow acceleration sensing along three sensitivity axes (u, v, w, x, y);

- with the sensitivity axes (u, v, w, x, y) of the sensor elements of the acceleration sensors (11, 12, 13, 14) spanning a plane, which after the control arrangement has been integrated in a motor vehicle is essentially parallel to a plane defined by a longitudinal axis of the vehicle (A-A') and a transverse axis of the vehicle (B-B');
- with the control arrangement having at least one evaluation device, which in normal and crash mode tests the plausibility of all output signals (a_u, a_v, a_w, a_x, a_y) of the sensors by means of a safing algorithm by creating a weighted sum from the output signals (a_u, a_v, a_w, a_x, a_y) and evaluates the output signals (a_u, a_v, a_w, a_x, a_y) by means of a crash discrimination algorithm; and in test mode sends a test signal to at least two acceleration sensors (11, 12, 13, 14) to generate output signals to test the operation of the sensors (11, 12, 13, 14).

The subject matter of the independent claim 1 differs in that at least one test signal can be modified by means of a weighting means by a predefinable weighting factor such that at least one acceleration sensor outputs a weighted output signal; and in that during the test routine, the output signals of the acceleration sensors arranged in the sensor field can be processed according to the safing routine, with the weighted sum of the output signals producing a predefined value when the acceleration sensors are capable of operation; with the possibility of determining error-free operation of the control arrangement, when the weighted sum of the output signals actually supplied during the test routine produces approximately the predefined value.

The subject matter of the independent claim 7 differs in that at least one test signal is subjected to a weighting such that at least one acceleration sensor outputs a weighted output signal; and in that in test mode the output signals of the acceleration sensors arranged in the sensor field are processed according to the safing algorithm, with the weighted sum of the output signals producing a predefined value when the acceleration sensors are capable of operation; and with the possibility of determining error-free operation of the control arrangement, when the weighted sum of the output signals actually supplied during in test mode produces approximately the predefined value.

2.1 The subject matter of claims 1 and 7 is therefore novel (Article 33(2)PCT).
The object to be achieved with the present invention can therefore be seen as improving the testing of the operation of a system of a plurality of acceleration sensors in a control arrangement for occupant protection means in a motor vehicle.

2.2 The solution proposed for this object in claims 1 and 7 of the present application is based on an inventive step for the following reasons (Article 33(3)PCT):

Although operation of the acceleration sensors is tested in document D1 by creating a weighted sum from the output signals of the acceleration sensors, operation of the safing algorithm is not tested, as this is not referred back to in test mode.

2.3 Claims 2 - 6 are dependent on claim 1 and therefore also satisfy PCT requirements relating to novelty and inventive step.

Claims 8 - 23 are dependent on claim 7 and therefore also satisfy PCT requirements relating to novelty and inventive step.

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